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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/715,568

11/19/2003

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Q78557

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23373 7590 09/14/2007  
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EXAMINER

MCNELIS, KATHLEEN A

ART UNIT

PAPER NUMBER

1742

MAIL DATE

DELIVERY MODE

09/14/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/715,568	<b>Applicant(s)</b> MISHIMA ET AL.	
	<b>Examiner</b> Kathleen A. McNelis	<b>Art Unit</b> 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### Claims Status

Claims 1, 2 and 4-14 remain for examination wherein claims 1, 2, 4, 6 and 9-14 are amended.

### Acknowledgement of RCE

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CRF 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.115, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/26/2007 has been entered.

### Status of Previous Rejections

The following rejections are withdrawn in view of cancellation of claim 3:

Claim 3 under 35 U.S.C. 103(a) as being unpatentable over JP 2001-214212 (JP '212) in view of Floreen (U.S. Pat. No. 4,443,254) and JP-56-090957 (JP '957), and

Claim 3 under 35 U.S.C. 103(a) as being unpatentable over Smith Jr. et al. (U.S. Pat. No. 4,871,511).

The following rejection is withdrawn in view of amendments to the claims:

Claims 11-14 under 35 U.S.C. 103(a) as being unpatentable over JP 2001-214212 (JP '212) in view of Floreen (U.S. Pat. No. 4,443,254) and JP-56-090957 (JP '957).

The following rejections are maintained:

Claims 1, 2, 5, 6 and 9 under 35 U.S.C. 103(a) as being unpatentable over JP 2001-214212 (JP '212) in view of Floreen (U.S. Pat. No. 4,443,254) and JP-56-090957 (JP '957),

Claims 4, 7, 8 and 10 under 35 U.S.C. 103(a) as being unpatentable over JP 2001-214212 (JP '212) in view of Floreen (U.S. Pat. No. 4,443,254) and JP-56-090957 (JP '957) as applied to claims 1, 5, 6 and 9 alone or in further view of Uehara et al. (U.S. Pat. No. 6,767,414),

Claims 1 and 2 under 35 U.S.C. 103(a) as being unpatentable over Smith Jr. et al. (U.S. Pat. No. 4,871,511), and

Claim 4 under 35 U.S.C. 103(a) as being unpatentable over Smith Jr. et al. as applied to claim 1, and further view of Uehara et al. (U.S. Pat. No. 6,767,414).

#### **DETAILED ACTION**

##### ***Claim Rejections - 35 USC § 112***

Claims 1, 2, 4 and 9-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites: "...the consumable electrode containing not less than 5 ppm of Mg, and non-metallic inclusions comprising nitrides having a nucleus of MgO..."

It is unclear if this means:

1. Containing not less than 5 ppm of a total of Mg and non-metallic inclusions comprising nitrides having a nucleus of MgO,
2. Containing not less than 5 ppm of Mg, and additionally containing an unspecified amount of non-metallic inclusions comprising nitrides having a nucleus of MgO, or
3. Containing not less than 5 ppm Mg and not less than 5 ppm of non-metallic inclusions comprising nitrides having a nucleus of MgO.

For purposes of examination, any of the above interpretations can be used to satisfy the claim limitation.

##### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 5, 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-214212 (JP '212) in view of Floreen (U.S. Pat. No. 4,443,254) and JP-56-090957 (JP '957).

JP '212 in view of Floreen and JP '957 is applied to claims 1, 2, 5, 6 and 9 as discussed in the 02/26/2007 Office action.

Regarding the amended limitations to claims 1, 2 and 6, JP 2001-214212 (JP '212) discloses a method for producing Ti-containing maraging steel (§ 0001) by vacuum inducting melting as in instant claim 2 followed by vacuum arc re-melting (§s 0014-0017) as in instant claim 1. Examiner contends that the "vacuum arc dissolving-again" term used in the translation of JP '212 is the same as vacuum arc remelting, since it is a step of remelting an electrode formed by a previous vacuum melting step. The composition disclosed by JP '212 compared with instant claims is as follows:

Component	Instant	JP '212 (§ 0012)
C	$\leq 0.01\%$ (claim 6)	$\leq 0.01\%$
Ni	8.0% to 22.0% (claim 6)	16 – 26%
Co	5.0 to 20.0% (claim 6)	5-16%
Mo	2.0 to 9.0 % (claim 6)	2-10%
Ti	$0.3\% \leq \text{Ti} \leq 2.0\%$ (claims 1 & 6)	0.1 to 2.0%
Al	$\leq 1.7\%$ (claim 6)	0.03- 0.4%
Mg	< 15 ppm (claim 1) 0 < Mg < 15 ppm (claim 5) 0 < Mg < 10 ppm (claim 6)	Not stated
O	< 10 ppm (claims 5 & 6)	Not stated
N	< 15 ppm (claims 5 and 6)	Not stated
Impurities + Fe	Balance (claims 5 and 6)	Remainder

JP '212 does not disclose adding Magnesium to the steel.

Floreen discloses a method for producing a cobalt-free maraging steel (abstract) containing nickel (17 – 19%), molybdenum (1-4%), titanium (1.25-2.5%), aluminum (0.25 to 0.3%) and up to 0.03% carbon, balance iron, trace additives and impurities (col. 1 line 64- col. 2 line 21). With the exception of cobalt, the ranges of primary alloying elements are within, overlapping or close to the ranges in the instant claims and JP '212. The maraging steel is preferably produced by vacuum

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induction melting, followed by vacuum arc remelting. Magnesium is added for deoxidizing and/or malleabilizing purposes (col. 3 lines 11-16) up to 0.25% (col. 5 lines 9-10). A stated objective in JP '212 is reduction of impurities including oxygen (§ 0002) and JP '212 discloses compressive working of the steel (§s 0016 and 0017, forging into coils). Malleability is a property that allows plastic deformation in compression without fracture; therefore increasing malleability would have been desired in JP '212. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use magnesium as taught by Floreen in the maraging steel production process of JP '212 as a deoxidizer and to increase malleability as taught by Floreen. The range of up to 0.25% overlaps the claimed ranges of  $\geq 5$  ppm in the consumable electrode (claim 1),  $< 15$  ppm in the produced steel (claim 1) or more than zero to less than 10 ppm Mg in the produced steel (claim 6); therefore a prima facie case of obviousness exists.

The maraging steel in Floreen does not contain cobalt. JP 56-090957 (JP '957) teaches a method of producing maraging steel containing cobalt, nickel, molybdenum and titanium wherein magnesium is added (abstract) as a deoxidizing agent and to improve the maraging steel's resistance to stress corrosion cracking (p. 3). While JP '957 does not disclose the same production method as JP '212 in view of Floreen, this prior art is cited as evidence that magnesium can be used as a deoxidizer in a maraging steel containing cobalt as well as titanium, nickel, aluminum and molybdenum alloying elements. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use magnesium as taught by Floreen and JP '957 in the production of maraging steel in the process of JP '212 to deoxidize as taught by Floreen and JP '957.

Although not recited in JP '212 in view of Floreen and JP '957, vaporization of the magnesium would be expected during melting of the steel, since Mg boils at 1090 °C whereas a

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temperature of about 1540 °C is required to melt iron (principal constituent in steel), and since JP '212 discloses melting (e.g. paragraphs 0016-0017, Examples 1 and 2).

Regarding the amended limitation to claim 9, JP '212 discloses vacuum arc remelting as discussed above regarding claims 1 and 2.

Claims 1, 2, 5, 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-214212 (JP '212) in view of Smith Jr. et al. (U.S. Pat. No. 4,971,511).

With respect to claims 1, 2, 5 and 6, JP 2001-214212 (JP '212) discloses a method for producing Ti-containing maraging steel (¶ 0001) by vacuum inducing melting as in instant claim 2 followed by vacuum arc re-melting (¶s 0014-0017) as in instant claim 1. Examiner contends that the “vacuum arc dissolving-again” term used in the translation of JP '212 is the same as vacuum arc remelting, since it is a step of remelting an electrode formed by a previous vacuum melting step. JP '212 discloses that desirable properties are high hardness, high strength and high fatigue characteristics for uses such as solid rockets (paragraph 0002). The composition disclosed by JP '212 compared with instant claims is as follows:

Component	Instant	JP '212 (¶ 0012)
C	≤ 0.01 % (claim 6)	≤ 0.01%
Ni	8.0% to 22.0% (claim 6)	16 – 26%
Co	5.0 to 20.0% (claim 6)	5-16%
Mo	2.0 to 9.0 % (claim 6)	2-10%
Ti	0.3% ≤ Ti ≤ 2.0% (claims 1, 5& 6)	0.1 to 2.0%
Al	≤ 1.7 % (claim 6)	0.03- 0.4%
Mg	< 15 ppm (claim 1) 0 < Mg < 15 ppm (claim 5) 0 < Mg < 10 ppm (claim 6)	Not stated
O	< 10 ppm (claims 5 & 6)	Not stated
N	< 15 ppm (claims 5 and 6)	Not stated
Impurities + Fe	Balance (claims 5 and 6)	Remainder

Although JP '212 does not recite the content of O or N, JP '212 discloses reduction of N and O impurities by substantially the same processing methods as the instant invention (0003).

JP '212 does not disclose adding magnesium to the steel.

Smith Jr. et al. discloses a maraging steel containing at least 1 to 1.25 % Ti, 2-4 % Mo, 17-19% Ni, up to about 0.05 % C and 0.05 to 1% Al (col. 1 lines 59-68) for applications such as rocket motors (col. 1 lines 26-35). Smith Jr. et al. discloses that the steel may contain up to 0.25 % calcium and/or magnesium and that while not required, cobalt may be included (col. 2 lines 1-13). With the exception of cobalt, the ranges of primary alloying elements are within, overlapping or close to the ranges in the instant claims and JP '212. Smith Jr. et al. discloses processing by melting, followed by vacuum induction melting followed by vacuum arc remelting (col. 2 lines 54 – 60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include up to 0.25% Mg as taught by Smith Jr. et al. in the steel of JP '212 since Smith Jr. et al. discloses such addition in a substantially similar steel intended for similar use. The range of up to 0.25% overlaps the claimed ranges of  $\geq 5$  ppm in the consumable electrode (claim 1),  $< 15$  ppm in the produced steel (claim 1) or between 0 and 15 ppm in the produced steel (claim 5) or more than zero to less than 10 ppm Mg in the produced steel (claim 6); therefore lacking evidence of the criticality of the claimed ranges, a prima facie case of obviousness exists.

Although not recited in JP '212 in view of Smith Jr. et al., vaporization of the magnesium would be expected during melting of the steel, since Mg boils at 1090 °C whereas a temperature of about 1540 °C is required to melt iron (principal constituent in steel), and since JP '212 discloses melting (e.g. paragraphs 0016-0017, Examples 1 and 2).

With respect to claim 5, JP '212 in view of Smith Jr. et al. does not disclose that the content of the spinel form inclusions having a size of not less than 10  $\mu\text{m}$  in length divided by the



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total content of the spinel form inclusions having a size of not less than 10  $\mu\text{m}$  in length plus the alumina inclusions having a size of not less than 10  $\mu\text{m}$  in length is more than 0.33. However, as discussed above, the composition and method of making the maraging steel taught by JP '212 in view Smith Jr. et al. is substantially the same as that of the instant invention. Therefore, it is inherent that the proportion of nonmetallic inclusions of spinel and alumina should be substantially the same in JP '212 in view of Smith Jr. as the instant invention.

Regarding the amended limitation to claim 9, JP '212 discloses vacuum arc remelting as discussed above regarding claims 1 and 2.

Claims 4, 7, 8 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-214212 (JP '212) in view of Floreen (U.S. Pat. No. 4,443,254) and JP-56-090957 (JP '957) as applied to claims 1, 5, 6 and 9 alone or in further view of Uehara et al. (U.S. Pat. No. 6,767,414).

JP '212 in view of Floreen and JP '957 is applied as discussed above regarding claims 1, 5, 6 and 9.

JP '212 in view of Floreen and JP '957 discloses manufacturing a thin strip of 3.5 mm thickness (JP '212 ¶ 0017), which is close enough to the claimed range of not more than 0.5 mm that one of ordinary skill in the art would expect the same results.

Alternatively, JP '212 in view of Floreen and JP '957 does not teach that the thin strip is rolled to a thickness of not more than 0.5 mm.

Uehara et al. (abstract) discloses a maraging steel with composition similar to that of JP '212 in view of Floreen and JP '957 where the maraging steels were melted using VIM and hot rolled to a thickness of about 0.3 mm (col. 8 lines 6-20). Therefore one of ordinary skill in the art would expect that the maraging steel produced by JP '212 in view of Floreen and JP '957 could be

rolled to a thickness of 0.3 mm as taught by Uehara et al. since Uehara et al. discloses producing a 0.3 mm strip using a maraging steel of similar composition and produced in a similar manner as JP '212 in view of Floreen and JP '957.

Claims 4, 7, 8 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-214212 (JP '212) in view of Smith Jr. et al. (U.S. Pat. No. 4,971,511) as applied to claims 1, 5, 6 and 9 alone or in further view of Uehara et al. (U.S. Pat. No. 6,767,414).

JP '212 in view of Smith Jr. et al. is applied as discussed above regarding claims 1, 5, 6 and 9.

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Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith Jr. et al. (U.S. Pat. No. 4,871,511).

Smith Jr. et al. is applied to claims 1 and 2 as set forth in the 09/27/2006 Office action.

Regarding the amended limitations to claim 1, Smith Jr. et al. discloses that up to 0.25% of Mg may be present (col. 2 lines 7-12), which overlaps the claimed range of at least 5 ppm in the ingot and less than 15 ppm in the produced steel; therefore a prima facie case of obviousness exists (M.P.E.P. § 2144.05). Although not recited in Smith Jr. et al., vaporization of the magnesium would be expected during melting of the steel, since Mg boils at 1090 °C whereas a temperature of about 1540 °C is required to melt iron (principal constituent in steel), and since Smith Jr. et al. discloses melting (col. 2 lines 54-60).

Regarding the amended limitation to claim 2, Smith Jr. discloses vacuum induction melting (col. 2 lines 54-60).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith Jr. et al. as applied to claim 1, and further view of Uehara et al. (U.S. Pat. No. 6,767,414).  
Smith Jr. et al. in view of Uehara et al. is applied as set forth in the 09/27/2006 Office action.

Regarding the amended limitation to claim 4, Smith Jr. et al. discloses vacuum arc remelting (col. 2 lines 54-60).

#### **Additional Citations**

The Metals Handbook defines “malleability” as the characteristic of metals that permits plastic deformation in compression without fracture (p. 38).

#### ***Response to Arguments***

Applicant's arguments filed 07/26/2007, 8/24/2007 and 09/15/2007 have been fully considered but they are not persuasive.

Arguments are summarized as follows:

1. The prior art teaches the use of Mg for deoxidation, but does not teach that MgO formed during deoxidation should remain after VIM processing.

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2. The instant invention has no relationship to the prior art that includes Mg to improve workability since the instant invention requires VAR under which Mg would be lost.
3. In JP '212, no Mg is used and refining is achieved by selecting raw material and not by Mg reaction.
4. JP '957 and Floreen have no relationship to the instant invention that is directed to the refining of non-metallic inclusions in steel. Although JP '957 and Floreen teach the addition of Mg to maraging steel, there is no motivation to add the Mg to the Ti-containing steel or maraging steel for purposes other than deoxidation since it has not been known that oxides can be refined by the VAR process and that TiN can be refined by Mg.
5. Smith discloses Mg as only one example of an additive element which may be combined with maraging steels. One of ordinary skill would not be led to adding Mg and thereafter refining non-metallic inclusion by VAR processing.
6. The conventional processes for manufacturing maraging steels containing Ti cannot take advantage of VAR processing, therefore there are no reasons to base a rejection on lack of inventive step.
7. Applicant has provided TiN size comparison data in pages 14-25 of the 7/26/2007 Remarks comparing TiN size in an electrode before VAR in Mg free conditions.
8. Applicant has submitted schematic material with the 08/24/2007 Remarks showing possible reaction mechanisms during the process reactions.
9. Applicant has submitted arguments with the 09/15/2007 Remarks indicating that while there is no experimental data on a maraging steel after the VAR process which contains more than 15 ppm Mg, the skin would become rough at over 15 ppm and since Mg is expensive one of ordinary skill in the art would be more likely to add Ca than Mg when choosing between Ca and/or Mg in the disclosure of Smith et al.

Examiner's responses are as follows:

1. The instant claims require not less than 5 ppm of Mg and non-metallic inclusions comprising nitrides having a nucleus of MgO in the consumable electrode, whereby the MgO type inclusion decompose so that the Mg content is reduced from the Mg content

of the consumable electrodes due to volatilization, and where the produced steel contains less than 15 ppm Mg (claim 1). This limitation does not require that the MgO formed during deoxidation remains after VIM processing as argued.

2. The instant claims require that the Mg content of the final steel is less than 15 ppm (claim 1), between 0 and 15 ppm (claim 5) or between 0 and 10 ppm (claim 2). The ranges disclosed by the prior art of up to 0.25 % Mg overlaps these ranges as discussed above in the grounds for rejection. In the cited prior art where Mg is retained in the final steel, Smith Jr. et al. (col. 2 lines 54-60) and Floreen (col. 3 lines 10-16) both disclose the use of vacuum arc remelting (VAR), therefore this argument is not persuasive.
3. Examiner has acknowledged that JP '212 does not specifically recite the addition of Mg, however secondary references Floreen, JP '957, and Smith Jr. et al. each recite the addition of Mg to similar steel as discussed above in the grounds for rejection.
4. JP '957 and Floreen are cited as secondary references teaching the addition of Mg to a steel which is substantially similar to the primary reference JP '212. The motive to combine these references is discussed above in the grounds for rejection. In addition to deoxidation, Floreen teaches that such addition improves malleability of the steel. Malleability is a property which permits plastic deformation during compression without fracture, and would therefore be desired in JP '212 since compressive working is required. Therefore in addition to the benefit of deoxidation, the addition of Mg to JP '212 to increase malleability would have been obvious in view of Floreen as discussed above in the grounds for rejection. In response to applicant's argument that it has not been known that oxides can be refined by the VAR process and that TiN can be refined by Mg, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).
5. Smith discloses the addition of Mg and VAR processing as discussed in the grounds for rejection. In response to applicant's argument that one of ordinary skill would not be led to adding Mg and thereafter refining non-metallic inclusion by VAR processing,

this is essentially the process disclosed by Smith as discussed above in the grounds for rejection. The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

6. The reasons have been set forth above in the grounds for rejection. Further, JP '212 discloses a Ti containing maraging steel which is processed by vacuum arc remelting (e.g. Example 1 paragraph 0016), and Smith Jr. et al. discloses a Ti containing maraging steel (col. 1 lines 60-68) subjected to VAR (col. 2 lines 54-60); therefore the argument is not persuasive.
7. If the new data provided in pp. 14 to 25 (such as figure on p. 15) is provided as evidence, it should be provided in the form of a declaration as required by 37 CFR 1.132 to be considered. Further, it is unclear what claim this information is directed towards. Claim 1 does not recite the size of inclusions. Claim 5 limits the size of oxide inclusions in the produced steel. Depending claim 9 recites the size of nitride type non-metallic inclusions after VAR as having a critical length of not more than 15  $\mu\text{m}$ , however p. 15 of the remarks seems to indicate that control to not more than 10.8  $\mu\text{m}$  is critical after VAR. This does not support the criticality of not more than 15  $\mu\text{m}$ . Regarding the arguments related to the size of alumina inclusions if Mg is not included, it is unclear how this is commensurate in scope with the claims or establishes the criticality of the amount of Mg inclusion since the amount of Mg is not recited in conjunction with the sample data, despite the conclusory statement on p. 22 that "It is seen from Table 5 that concerning oxide, when the Mg content of the consumable electrode exceeds 5 ppm..." If this is intended to establish the criticality of the ranges, test results should be provided which bracket the critical range, such as results from electrodes containing just above 5 ppm Mg compared with results from electrodes containing just below 5 ppm Mg.
8. While the information is helpful in understanding the invention, it does not alter the issue of patentability over the prior art. The claims are drawn to a method for manipulating a specific starting composition to produce a final composition. The prior

art discloses essentially the same compositions manipulated by essentially the same methods to produce essentially the same product.

9. Conclusory statements do not take the place of evidence. The arguments are not sufficient to establish the criticality of 15 ppm Mg. Ca and Mg are disclosed as functional equivalents in Smith Jr. et al.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen A. McNelis whose telephone number is 571 272 3554. The examiner can normally be reached on M-F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KAM  
09/11/2007



ROY KING  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700